

16  
Dep  
Jack (F. L.)

FURTHER NOTES ON REMOVAL OF  
THE STAPES.

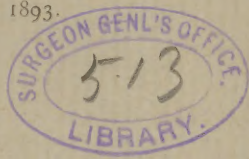
BY

FREDERICK L. JACK, M. D.,

ASSISTANT SURGEON, MASSACHUSETTS CHARITABLE EYE AND EAR INFIRMARY, ETC.

---

*Reprinted from the Boston Medical and Surgical Journal  
of January 5, 1893.*





## FURTHER NOTES ON REMOVAL OF THE STAPES.

BY FREDERICK L. JACK, M.D.

At the last meeting of the American Otological Society, July 20, 1892, I presented for consideration a new method of treatment for the relief of symptoms attending adhesive inflammations of the middle ear. This method, the removal of the stapes, was described, and sixteen cases were reported as the beginning of a series of original investigations. The results gave reason to hope that a means of relief in many cases was on the verge of realization. Aural surgery, as is well known, had by degrees been advancing in the direction of the oval window, and there was a growing belief that an open fenestra ovalis would very greatly improve the power of hearing.

Among those who had published their investigations in this direction are these: Kessel, in 1875, first performed circumcision of the stapes, with improvement. In 1876 Michel<sup>1</sup> perforated the drum, and exerted pressure upon the stapes with a sound, improvement in hearing following. In 1888 this operation was revived by Boucheron and Miot.<sup>2</sup> Tenotomy of the stapedius muscle was first performed by Kessel,<sup>3</sup> and later by Urbantschitsch,<sup>4</sup> who out of three cases got

1 Zeitschrift fur med. Wiss., 1876, No. 42.

2 Bullet. med. de Paris, 1888, p. 555.

3 Archiv fur Ohrenheilkunde, vol. ii, p. 199.

4 Wien. med. Pr., 1877, vol. xviii-xxi.



improvement in two. Cases of exfoliation of the stapes with improved hearing have been reported by Berthold.<sup>5</sup> He ascribed the gain to the closing artificially of a perforation in the drum. Also cases by Troltsch,<sup>6</sup> by Buck,<sup>7</sup> by Bœck,<sup>8</sup> and two cases by Schwartze.<sup>9</sup> One case of accidental removal, with improvement in hearing, by Botey.<sup>10</sup> He also removed the stapes from animals safely and thereby improved their hearing.

The practicability of this procedure on the human subject has now been fully demonstrated by several observers and its value in some cases clearly proven. No claim is made that it will help all cases, but it surely does some. My object in this paper is to give the results of further observations and experience with the operation, especially as to its technique, and its application to the different forms of middle-ear disease; also to record the permanency of the good results in most of the original sixteen cases.

In general the operation previously described is employed.<sup>11</sup> There are a few details however worthy of brief notice. The shape of the incised piece of membrane is immaterial, but it is important to carry the posterior and upper cut as close to the auditory ring as possible, for in not a few cases the joint is on a line with this ring or situated a little above it. Usually, after any incision except a straight one, the membrane curls away from the edge of the wound. Cases will undoubtedly occur where, from bony ankylosis, or from a high position of the oval window, or

5 Zeitschrift für Ohrenheilkunde, vol. xix, p. 1.

6 Archiv für Ohrenheilkunde, vol. iv, p. 100.

7 Manual of Diseases of the Ear.

8 Archiv für Ohrenheilkunde, vol. viii, p. 228.

9 Archiv für Ohrenheilkunde.

10 Experiences d'avulsion de l'étrier chez les animaux, Annales des maladies de l'oreille, No. 1, January 1891.

11 Boston Medical and Surgical Journal, November, 10, 1892.



what is practically the same thing, a prominent auditory ring, removal of the ossicle is rendered more difficult. At times it is impossible to remove the bone entire. When the head of the bone is high up, the operator must by careful manipulation pass the hook between the crura. The sense of feeling can be the only guide, since the bone is beyond the range of sight. A case recently operated on best illustrates this point, and also one other point, namely, the importance of a differential diagnosis:

Miss C., thirty years old, complained of progressive deafness of many years standing in both ears. The left membrana tympani was very much thickened and retracted, manubrium decidedly foreshortened, leaving a much-contracted field for operating. The usual small triangular opening in the drum was made. The incudo-stapedial joint could be made out only when the assistant held the patient's head considerably to one side. The operation was performed in the usual way up to the point of extraction of the stapes. This step was made entirely in the dark, on account of the high position of the oval niche. The ossicle was quickly found and removed, with so little resistance however as to lead to the belief that it could have offered little obstacle to the sound waves and that therefore the hearing apparatus beyond in the vestibule was the real seat of the trouble. This condition was strongly suggested by the tests made before the operation, and it was confirmed afterwards by the same means. There was no dizziness, and the patient, as frequently happens, was up and about on the next day.

In all cases the ear should be rendered aseptic by syringing with a mild antiseptic fluid some time before the operation, in order to avoid congestion of the

tissues, because in such a condition the parts are not well defined. It is seldom necessary to cut or injure the mucous membrane. Care should be taken to thoroughly perform each step, and to render the field of operation perfectly free from hæmorrhage by the use of a sterilized four per cent. solution of cocaine. In one case in which instruments dipped in ninety-five per cent. alcohol were used, a sharp inflammation followed the operation. That this was due to the irritating influence of the alcohol is a fair supposition, from the fact that in the operations before and after, in which a solution of carbolic acid (1 to 60) was always used for the instruments, no inflammatory reaction has occurred.

As regards the application of the operation to the different classes of ear disease. In cases of otitis media suppurativa, after the otorrhœa has ceased the incudo-stapedial joint is firmly fixed by bands of adhesion. Briefly described, this condition of the bone offers a mechanical hindrance to the transmission of sound waves to the vestibule. Relieving this obstruction by removal of the stirrup is found to increase the hearing power for the voice very materially.

Another set of cases is very similar pathologically, otitis catarrhalis adhæsiva. There is proliferation of tissues with ankylosis of the ossicular chain. Here again good results by removal of the bone have been demonstrated.

There is a third class, otitis media insidiosa (sclerosis), in which it is generally believed that the ankylosis is not fibrous but osseous. This condition is usually characterized by a high degree of deafness and tinnitus. Appearances of the tympanum are either normal or nearly so. Judging from a few experiences with this troublesome condition, the region of the foot-plate

would appear to be the principal seat of the bony ankylosis. I can only say in evidence of this that in some of these cases the foot-plate, in part or whole, remained behind after the removal of the head and crura, an accident which at present is unavoidable and insurmountable. As might be expected the improvement in hearing is not as great as in other cases. Larger experience with this class of cases may, however, give better results.

It seems hardly necessary to say that diseases of the internal ear are not affected by this operation. It must be carefully determined beforehand therefore in each case by special tests whether the impairment of hearing is due in part or whole to changes in the labyrinth.

It is now six months since the first cases were operated upon, long enough to form some idea as to the permanency of the results. Most of these cases have been again tested within a week, by Dr. William S. Bryant and myself, aided by Dr. Crockett, house-officer. The ears, without a single exception, have remained healed; the wound in the drum in most cases was found cicatrized, thereby restoring the natural protection to the middle ear.

The influence of the operation on tinnitus aurium, judged by these cases, is very uncertain. Some, in whom it existed previous to the operation, have been free from this trouble since. On the other hand, the reverse is true in a few cases where a slight noise is now noticed at times.

A matter of considerable interest is the effect of removal on the labyrinth. Theoretically there should be a grand general disturbance; practically this is not the case. The symptom, vertigo, was closely searched for, but was found in one case only, that of

a woman forty-seven years of age. Dizziness was, however, an old complaint with her, and was very likely due to dyspepsia. She volunteered the information that the trouble was less frequent of late than for a short time after the operation. In a few cases vertigo, which was complained of before the operation, had entirely disappeared.

The improvement noted in hearing the tuning-fork, both by air and bone, was found essentially the same as when tested six months ago.

The test by König's rods showed in one case a slight gain of 5,000 vibration per second; in another, the loss of the same. In one case the considerable gain of 15,000 vibrations after the operation was still held.

The hearing for the watch indicated in some cases a slight gain, in others, a slight loss. In cases of slight loss for the watch and rods, this of course indicating a diminished perception for high tones, the hearing power for the voice was apparently increased. This peculiarity in the relation between hearing the voice and high tones is frequently found among deaf people.

We now come to the point of most importance, to the patient at least, namely, a report of the hearing power for the voice. It is impossible at present to apply tests for this with anything like scientific accuracy. This is especially true in cases where the hearing is good in one ear and bad in the other. In these cases the ear on the other side was tightly stopped with cotton and the finger of an assistant pressed tightly into the meatus. In those cases where the oval window was completely cleared, the change, if any, was a slight increase of hearing since that immediately following the operation. There was one



exception. On the other hand, where the foot-plate remained, there was practically no change from preceding tests. In one case of removal from both ears the hearing remained perfectly good for five months, and was then somewhat dulled after a head cold, which closed the Eustachian tubes and caused marked retraction of the membrane. After inflation of both middle ears through the catheter the hearing was restored in one and partially so in the other. This would seem to show that the cicatrix over the oval niche was driven into the window by the closing of the tubes, and acted as an obstruction. It is proposed to remove, under cocaine, a piece of membrane from one side, with the object of contracting the cicatricial drum. By this it is hoped to counteract the tendency of the cicatricial membrane to sink into the fenestra.

In conclusion, I wish to emphasize the importance of a careful differential diagnosis in each case before advising the operation.





